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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,586	06/16/2006	Peter Larsson	P18804-US1	8104

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EXAMINER	
GREENE, JOSEPH L	
ART UNIT	**PAPER NUMBER**
2151	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,586	LARSSON ET AL.	
	Examiner	Art Unit	
	JOSEPH L. GREENE	2151	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/16/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1 – 24 are currently pending in this application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-6 and 8-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Cain (Pre-Grant Publication No. US 2003/0204625 A1).

4. With respect to claim 1, Cain disclosed a multihop network (0009, lines 1-7 and figure 1) comprising: a source node (0009, lines 7-13); at least one neighboring node (figure 1, where the multiple nodes are each neighboring nodes); at least one active node (0009, lines 1-7, where the cluster leader is the active node); and a destination node (0009, lines 7-13), characterized by said nodes implementing a reactive routing protocol where a resource of the multihop network is adapted by one of the neighboring nodes or active nodes in response to a topology change in the multihop network to optimize the performance of a connection (106) between said source node and said destination node (0054, lines 1-3, where two nodes becoming very close is a

topography change and the desired outcome of eliminating one of the cluster leaders is an active adaptation to improve performance).

5. As for claim 2, Cain disclosed all of the limitations described in claim 1, including wherein said resource includes one or more of the following: a route; a channel; or one or more physical layer parameters (0009, lines 7-13, where this shows the route limitation).

6. As for claim 3, Cain disclosed all of the limitations described in claim in claim 1, including wherein said topology change includes one or more of the following: a movement of one of the nodes; one or more quality variations in a channel between said source node and said destination node; one or more changes in traffic patterns in the multihop network; one or more changes in transmit patterns in the multihop network; or one or more changes in resource allocations in the multihop network (0054, lines 1-11, where this shows the movement of node limitation).

7. As for claim 4, Cain disclosed all of the limitations described in claim 1, including wherein said one of the neighboring nodes or active nodes adapts the resource in an opportunistic manner in response to an instantaneous topology change in the multihop network (0054, lines 1-11).

8. As for claim 5, Cain disclosed all of the limitations described in claim 1, including wherein said one of the neighboring nodes or active nodes adapts the resource in a distributed manner (0054, lines 1-11, where the cluster is the distributed manner) where at least one of the neighboring nodes is inserted into the connection between said source node and said destination node and where at least one of the active nodes is removed from the connection between said source node and said destination node (0054, lines 1-11, where the cluster leader is the active node between the source and destination devices).

9. As for claim 6, Cain disclosed all of the limitations described in claim 1, including wherein said one of the neighboring nodes or active nodes adapts the resource in a distributed manner (0054, lines 1-11, where the cluster is the distributed manner) where at least one of the active nodes is removed from the connection between said source node and said destination node (0054, lines 1-11, where the cluster leader is the active node between the source and destination devices).

10. With respect to claim 8, Cain disclosed method for optimizing the performance of a connection between a source node and a destination node in a multihop network (figure 1, and 0054, lines 1-3, where this shows the multi-hop network and the cluster leader node is an active node between a source and destination device), said method comprising the steps of: transmitting a beacon containing a measure of performance for the connection from at least one active node associated with the connection between

the source node and the destination node (0053, lines 10-18, where the data/message that node k transferred to node m that contained information about its metric is the beacon): receiving at least one of the transmitted beacons at least one neighboring node associated with the connection between the source node and the destination node (0053, lines 10-18, where the data/message that node k transferred to node m that contained information about its metric is the beacon).

Cain also disclosed calculating at said at least one neighboring node a cost function based on the measure of performance in each received beacon (0053, lines 17-18); determining at said at least one neighboring node whether the cost function for the connection between the source node and the destination node can be improved if said at least one neighboring node adapts at least one resource in the multihop network (0053, lines 17-18, where improvement is the purpose of comparing the metrics); and if yes, adapting the at least one resource to improve the cost function for the connection between the source node and the destination node; or if no, maintaining the at least one resource in the connection between the source node and the destination node (0053, lines 17-18).

11. As for claim 9, Cain disclosed all of the limitations described in claim 8, including wherein each active node performs the receiving step, the calculating step, the determining step, the adapting step and the maintaining step (0053, lines 10-18).

12. As for claim 10, Cain disclosed all of the limitations described in claim 9, including wherein said at least one resource includes: a route; a channel; or one or more physical layer parameters (0009, lines 7-13, where this shows the route limitation).

13. As for claim 11, Cain disclosed all of the limitations described in claim 9, including wherein said adapting step includes inserting at least one of the neighboring nodes into the connection between the source node and the destination node and removing at least one of the active nodes from the connection between the source node and the destination node (0054, lines 1-11).

14. As for claim 12, Cain disclosed all of the limitations described in claim 9, including wherein said adapting step includes removing at least one of the active nodes from the connection between the source node and the destination node (0054, lines 1-11).

15. As for claim 13, Cain disclosed all of the limitations described in claim 8, including wherein said adapting step is performed when there is a topology change within the multihop network, said topology change includes: a movement of one of the nodes; one or more quality variations in a channel between the source node and the destination node; one or more changes in traffic patterns within the multihop network; one or more changes in transmit patterns within the multihop network; or one or more

changes in resource allocations within the multihop network (0054, lines 1-3, where this shows the movement of the node limitation).

16. As for claim 14, Cain disclosed all of the limitations described in claim 8, including wherein said at least one neighboring node adapts the at least one resource of the multihop network in an opportunistic manner in response to an instantaneous topology change in the multihop network (0054, lines 1-11, where the node cluster m is the neighbor node, as listed in 0053, lines 10-18).

17. As for claim 15, Cain disclosed all of the limitations described in claim 8, including wherein each beacon includes a general broadcast part and a connection related part that contains the measure of performance which includes: an accumulated cost for the connection between the source node and the destination node; or a maximum allowed power for the transmitting active node (0053, lines 10-18, where the calculated cost is found in lines 17-18).

18. With respect to claim 16, Cain disclosed a wireless multihop network (0009, lines 1-4) that implements a reactive routing protocol to optimize the performance of a connection between a source node and a destination node (figure 1, and 0054, lines 1-3, where this shows the multi-hop network and the cluster leader node is an active node between a source and destination device), said wireless multihop network comprising: at least one active node located in the connection between the source node

and the destination node (0009, lines 1-7, where the cluster leader is the active node), wherein each active node transmits a beacon containing a measure of performance for the connection between the source node and the destination node; and at least one neighboring node associated with the connection between the source node and the destination node (0053, lines 10-18, where the data/message that node k transferred to node m that contained information about its metric is the beacon), wherein each neighboring node receives at least one of the transmitted beacons (0053, lines 10-18, where the data/message that node k transferred to node m that contained information about its metric is the beacon), calculates a cost function based on the measure of performance in each received beacon (0053, lines 17-18), and adapts at least one resource in the wireless multihop network if it is possible to improve the cost function for the connection between the source node and the destination node (0053, lines 17-18).

19. As for claim 17, Cain disclosed all of the limitations described in claim 16, including wherein each active node performs the receiving step, the calculating step and the adapting step (0053, lines 10-18).

20. As for claim 18, Cain disclosed all of the limitations described in claim 16, including wherein said at least one resource includes: a route; a channel; or one or more physical layer parameters (0009, lines 7-13, where this shows the route limitation).

21. As for claim 19, Cain disclosed all of the limitations described in claim 16, including wherein said adapting step includes inserting at least one of the neighboring nodes into the connection between the source node and the destination node and removing at least one of the active nodes from the connection between the source node and the destination node (0054, lines 1-11, where the cluster leader is a neighboring node).

22. As for claim 20, Cain disclosed all of the limitations described in claim 16, including wherein said adapting step includes removing at least one of the active nodes from the connection between the source node and the destination node (0054, lines 1-11).

23. As for claim 21, Cain disclosed all of the limitations described in claim 16, including wherein each neighboring node performs the adapting step when there is a topology change within the wireless multihop network, said topology change includes: a movement of one of the nodes; one or more quality variations in a channel between said source node and said destination node; one or more changes in traffic patterns within the wireless multihop network; one or more changes in transmit patterns within the wireless multihop network; or one or more changes in resource allocations within the multihop network (0054, lines 1-3, where this shows the movement of the node limitation).

24. As for claim 22, Cain disclosed all of the limitations described in claim 16, including wherein each neighboring node performs the adapting step in an opportunistic manner when there is a real-time topology change within the wireless multihop network (0054, lines 1-11).

25. As for claim 23, Cain disclosed all of the limitations described in claim 16, including wherein each beacon includes a general broadcast part and a connection related part that contains the measure of performance which includes: an accumulated cost for the connection between the source node and the destination node, or a maximum allowed power for transmitting active node (0053, lines 10-18, where the calculated cost is found in lines 17-18).

26. With respect to claim 24, Cain disclosed a node which implements a reactive routing protocol and adapts a resource within a wireless multihop network in response to a topology change within the wireless multihop network to optimize the performance of a connection between a source node and a destination node (0009, lines 1-4 shows a wireless multi-hop network and figure 1, and 0054, lines 1-3, where this shows the multi-hop network and the cluster leader node is an active node between a source and destination device).

Claim Rejections - 35 USC § 103

27. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

28. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cain, as applied to claim 1, in view of Bark et al. (Pre-Grant Publication No. US 2002/0077138 A1), hereinafter Bark.

29. As for claim 7, Cain disclosed all of the limitations described in claim 1, including wherein said one of the neighboring nodes or active nodes adapts the resource in a distributed manner (0054, lines 1-11, where the cluster is the distributed manner), but Cain did not explicitly state doing so to satisfy one or more of the following conditions: meet a carrier to interference ratio; ensure existing connections meet their carrier to interference ratios; minimize aggregate power in the multihop network; or uses lowest cost to connect said source node and said destination node. However, Bark did teach doing so to satisfy one or more of the following conditions: meet a carrier to interference ratio; ensure existing connections meet their carrier to interference ratios; minimize aggregate power in the multihop network; or uses lowest cost to connect said source node and said destination node (title, where one of the systems adaptations can be found in section 0009, lines 5-7).

Both of the systems of Cain and Bark are directed towards managing multi-hop networks (see Bark, figure 4, where the different towers are different hops) and therefore, it would have been obvious to a person of ordinary skill in the art, at the time of the invention, to modify the teachings of Cain to make adaptations based on CIR, as taught by Bark, in order to increase the systems efficiency by adapting to a more diverse set of performing issues.

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(a) Klinker et al. (Patent No. US 7,222,190 B2), a routing control system.

(b) Jalloul et al. (Patent No. US 6,768,908 B1), a system that adapts to meet a carrier to interference ratio.

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH L. GREENE whose telephone number is (571)270-3730. The examiner can normally be reached on Monday - Thursday from 9:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on (571) 272-3964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JLG

/John Follansbee/

Supervisory Patent Examiner, Art Unit 2151